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Clarion

Service Manual

Model 550EX (GE-827E)

■SPECIFICATIONS:

60Hz/125Hz/250Hz/500Hz/1kHz/		
3kHz/10kHz·····	More than±12dB	
	(Each channel)	
Power supply voltage:	DC 14.4V (10.8~15.6V)	
	Negative ground	
Current consumption:	400mA	
Dimensions:	Width 178mm	
	Height 25mm	
	Depth 150mm	
Weight:	760g	

■COMPONENTS:

●GE-827E-51

Main unit		
Mounting bracket	300-5946-02	1
Mounting bracket	300-5946-03	1
Parts bag	921-8207-00	
Tap-screw (M5×20)	700-5020-80	2
Plate nut	725-0216-00	2
Screw	716-0673-00	4
Parts bag	922-1461-00	
Escutcheon	370-3961-00	1

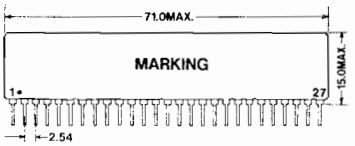
■FEATURES:

- Computer Control Equalizer.
- 7 Band Frequency Controls.
- Spectrum Analyzer.
- 3 Preset Memory Equalizing Level.
- Front/Rear Separate Equalizing Control.
- Electronic Dual Amplifier Balance Control.
- Effector.

■EXPLANATION OF IC's:

■051-0621-00 051-0621-01 7 Segment Graphic Equalizer

Outward Form



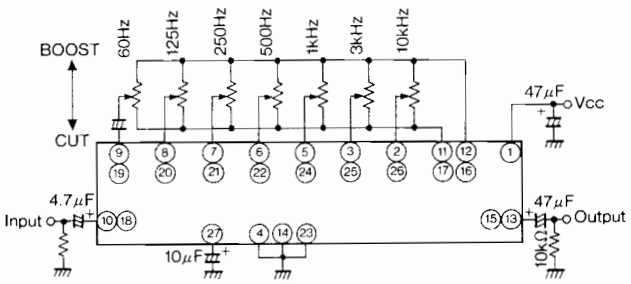
Absolute Maximum Ratings

Supply Voltage	V_{CC}	18V
Power Dissipation	P_D	500mW
Input Voltage	V_{IN}	5V

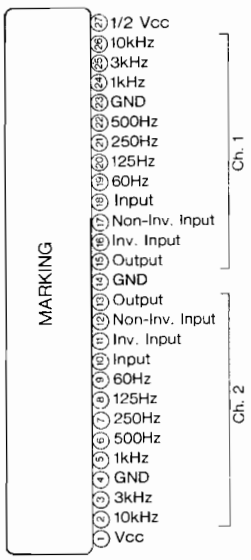
Electrical Characteristics (Vcc=8V, f=1kHz, Ta=25°C)

Item		Symbol	Condition	Rating	Unit
Voltage gain		Gv		0	dB
Effect	Boost	Gb	051-0621-00	11.0	dB
			051-0621-01	12.0	dB
	Cut	Gc	051-0621-00	−11.0	dB
			051-0621-01	−12.0	dB
Signal/Noise		S/N	051-0621-00	80 (min)	dB
			051-0621-01	70 (min)	dB
Total harmonic distortion		THD		0.1 (max)	%
Maximum output voltage		Vmax	THD=1%	1.7 (min)	V

Typical Circuit



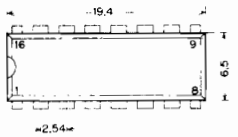
Terminal Connection



■BA6146 051-0795-00 12 dots Bar Level Meter Driver

BA6146 is monolithic IC for FL-level meter.
VU-display is made at 12 dots in between −20dB and +8dB.

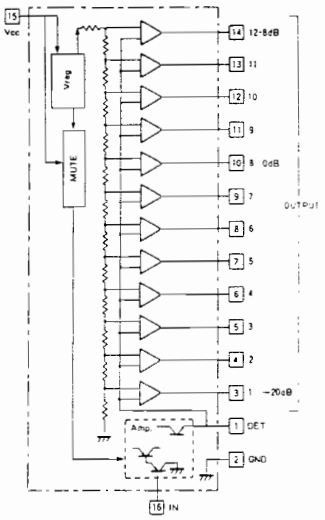
Outward Form



Absolute Maximum Ratings (Ta=25°C)

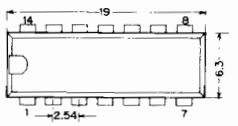
Item	Symbol	Rating	Unit
Supply voltage	V_{CC}	20	V
Power dissipation	P_D	550	mW
Maximum output current	$I_{OUT\ max}$	2	mA

Block Diagram



■M54516P 051-0265-50 5-Unit 500mA Darlington Transistor Array

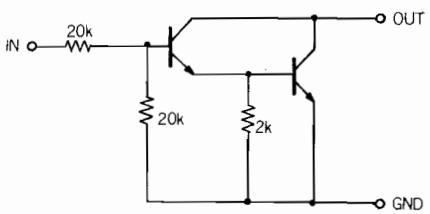
Outward Form



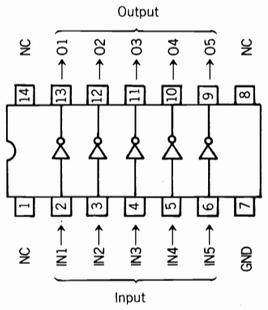
Absolute Maximum Ratings (Ta=25°C)

Item	Symbol	Rating	Unit
Collector-emitter voltage	V_{CEO}	25	V
Collector current (one unit)	I_C	500	mA
Input voltage	V_I	25	V
Collector dissipation	P_C	1.47	W

Equivalent Circuit

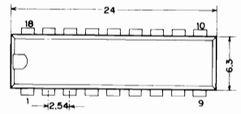


Terminal Connection



■M54562P 051-0565-00 M54563P 051-0569-00 Darlington Transistor Array

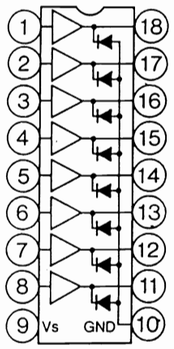
Outward Form



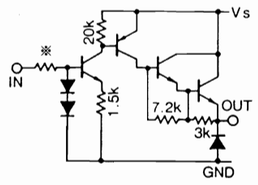
Absolute Maximum Ratings (Ta=−20~+75°C)

Item		Symbol	Rating	Unit
Collector-emitter voltage		V_{CEO}	50	V
Supply voltage		V_S	50	V
Input voltage	M54562P	V_I	0~30	V
	M54563P		0~10	
Output current		I_O	−500	mA
Power dissipation		P_D	1.79	W

Block Diagram



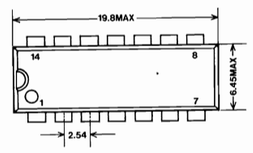
Equivalent Circuit



※ M54562P : 8.5k
M54563P : 3k

■MB84066BM-G 051-0267-80 Quad Bilateral Switch

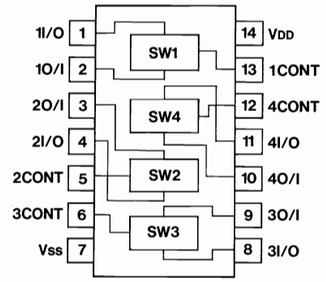
Outward Form



Maximum Ratings

Item	Symbol	Rating	Unit
Supply voltage	V_{DD}	$V_{SS}-0.5\sim V_{SS}+20$	V
Input voltage	V_{IN}	$V_{SS}-0.5\sim V_{DD}+0.5$	V
Output voltage	V_{OUT}	$V_{SS}-0.5\sim V_{DD}+0.5$	V
Input current	I_{IN}	±10	mA
Output current	I_{OUT}	±10	mA

Terminal Connection

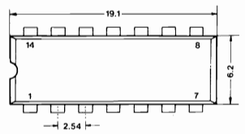


■MN4016B 051-0158-70 Quad Analog Switch

Outline

MN4016B is independent bi-directional analog switch for 4 circuits. By setting the enable-input (E) to "H" level, low impedance (ON-state) is obtained in between input and output of the switch, while high impedance (OFF-state) is obtained by setting to "L" level.

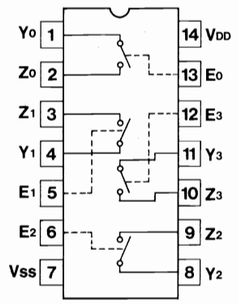
Outward Form



Absolute Maximum Ratings (Ta=25°C)

Item	Symbol	Rating	Unit
Supply voltage	V_{DD}	−0.5~+18	V
Input voltage	V_I	$-0.5\sim V_{DD}+0.5$	V
Output terminal voltage	V_O	$-0.5\sim V_{DD}+0.5$	V
Power dissipation	P_D	max. 400	mW

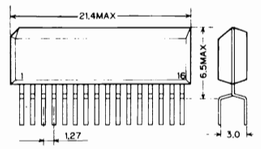
Block Diagram



Terminal Connection
$E_0\sim E_3$: Enable Input
$Y_0\sim Y_3$: Analog I/O
$Z_0\sim Z_3$: Analog I/O

■TA7414P 051-0744-00 Ground Isolator

Outward Form



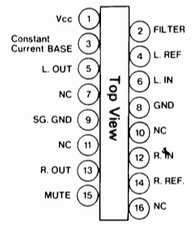
Maximum Ratings

Supply voltage V_{CC} 18V
Power dissipation P_D 750mW

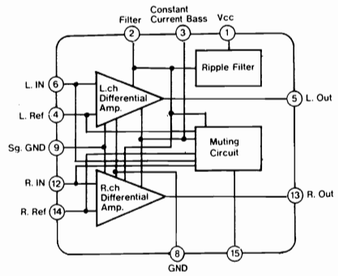
Electrical Characteristics (V_{CC}=13.2V, R_L=15kΩ, f=1kHz, Ta=25°C)

Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Current drain	I_{CCQ}	V_{IN}=0, Mute OFF	–	3	5	mA
Voltage gain	G_V	Vout=−10dBm	−2	0	+2	dB
Maximum output voltage	V_{OM}	V_{CC}=8V, THD=0.1%	−10	−8	–	dBm
Total harmonic distortion	THD	Vout=100mVrms, BW=400Hz~80kHz	–	0.01	0.03	%
Crosstalk	CT	V_{IN}=−10dBm	–	65	–	dB
Input impedance	Zi	Vout=−10dBm	–	70	–	kΩ
Output impedance	Zo	Vout=−20dBm	–	0.45	–	kΩ
Mute quantity	ATT	Vout=−10dBm	60	80	–	dB
Muting threshold voltage	V_M	ATT=3dB	1.7	2.2	2.7	V
Common mode rejection ratio	CMRR	V_{CM}=−10dBm	46	55	–	dB

Terminal Connection

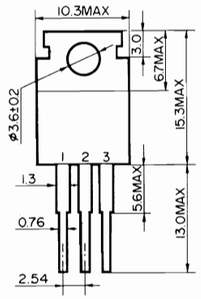


Block Diagram

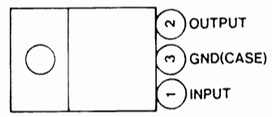


■TA78008AP 051-0624-00 3 Terminal Regulator

Outward Form



Terminal Connection



Absolute Maximum Ratings (Ta=25°C)

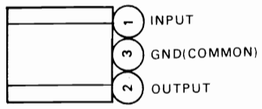
Item	Symbol	Rating	Unit
Input voltage	V_{DD}	35	V
Output current	V_I	1	A
Power dissipation	P_D	12.5	W

Electrical Characteristics (V_{IN}=14V, Tj=25°C)

Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Output voltage	V_{out}	I_{OUT}=100mA	7.7	8.0	8.3	V
Bias current	I_B	I_{OUT}=5mA	—	4.3	8.0	mA
Ripple regulating factor	RR	I_{OUT}=50mA, f_L=120Hz	58	74	—	dB
Min I/O voltage difference	V_D	I_{OUT}=1.0A	—	2.0	—	V

■TA78L006AP 051-0296-01 3 Terminal Voltage Regulater(6V)

Terminal Connection



Absolute Maximum Ratings (Ta=25°C)

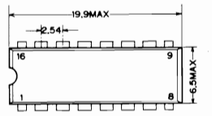
Input Voltage V_{IN} 35V
Power Dissipation P_D 800mW

Electrical Characteristics (V_{IN}=11V, I_{OUT}=40mA, C_{IN}=0.33μF, C_{OUT}=0.1μF, T_j=0~125°C)

			min	typ	max	
Output Voltage	V_{OUT}		5.76	6.0	6.24	V
Ripple Rejection Ratio	RR	f=120Hz, V_{IN}=9.0~19V	39	47		dB

■TC4051BP 051-0625-00 SINGLE 8-CHANNEL MULTIPLEXER/DEMULTIPLEXER

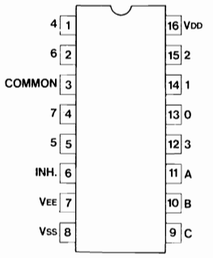
Outward Form



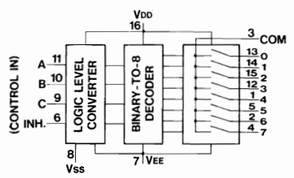
Maximum Ratings

Item	Symbol	Rating	Unit
Supply voltage	$V_{DD}-V_{SS}$	−0.5~20	V
	$V_{DD}-V_{EE}$		
Control input voltage	V_{IN}	$V_{SS}-0.5\sim V_{DD}+0.5$	V
Switch input/Output voltage	V_{IN}/V_{OUT}	$V_{EE}-0.5\sim V_{DD}+0.5$	V
Control input current	I_{IN}	±10	mA
I/O voltage at ON	V_{I-O}	−0.5~+0.5	V

Terminal Connection



Block Diagram



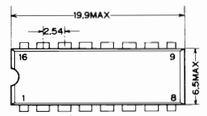
Truth Table

CONTROL INPUTS				"ON"
INHIBIT	C	B	A	CHANNEL
L	L	L	L	0
L	L	L	H	1
L	L	H	L	2
L	L	H	H	3
L	H	L	L	4
L	H	L	H	5
L	H	H	L	6
L	H	H	H	7
H	✱	✱	✱	NONE

✱ Don't Care

■TC9154P 051-0628-00 Electronic Volume

Outward Form



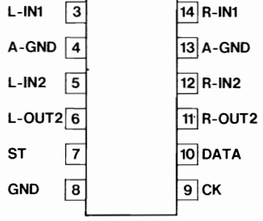
Features

- Control is possible for the attenuation up to 0dB~−66dB by 2dB/step.
- 2-channel built-in.
- Possible of use by both 1 and 2 power sources by (+), (−).
- By inputting each specified signal for STROBO-input terminal, DATA and CLOCK, from the outside, attenuation and channel-balance can be controlled optionally.

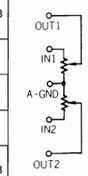
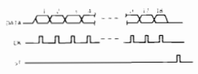
Maximum Ratings (Ta=25°C)

Item	Symbol	Rating	Unit
Supply voltage	V_{DD}	13	V
Input voltage	V_{IN}	$V_{SS}-0.3\sim V_{DD}+0.3$	V
Power dissipation	P_D	150	mW

Terminal Connection

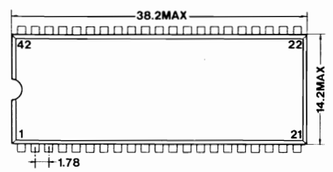


Terminal Function Table

Pin No.	Symbol	Function	Note
2 15	L-OUT1 R-OUT1	10dB step attenuator output terminal. The signal added to IN can be attenuated up to 0~−60dB at 7 stages with 10dB-step.	
3 14	L-IN1 R-IN1	10dB step attenuator input terminal.	
4 13	A-GND	Analog system ground.	
5 12	L-IN2 R-IN2	2dB step attenuator input terminal.	
6 11	L-OUT2 R-OUT2	2dB step attenuator output terminal. The signal added to IN can be attenuated up to 0~−8dB at 5 stages with 2dB-step.	
10	DATA	Data-input terminal of channel selection, attenuation. Input is made by CK-signal composed by 18 bits.	
9	CK	Clock input terminal for read the data.	
7	ST	Strobo input terminal. The channel-selecting signal of attenuation taken by CK-terminal and data can be latched by setting this terminal at "H" level. When this terminal is not applied with "H" level, the previous data is kept.	
1	V_{SS}	Power supply terminal.	
16	V_{DD}		
8	GND	Ground.	

■TC9187N 051-0808-00 Electronic Volume for 7 band Graphic Equalizer

Outward Form



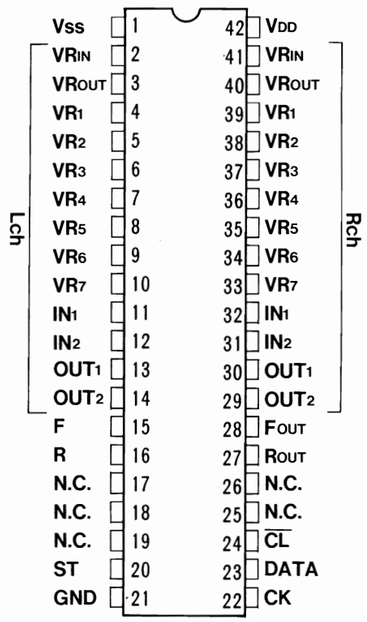
Features

- Electronic volume is built in for graphic equalizer of 7 circuits each for Lch and Rch.
- Each electronic volume is variable to 13 steps (±12dB/2dB step) optionally by inputting the specified serial data.
- Fader control or analog switch matrix for graphic IN/OUT is built in.

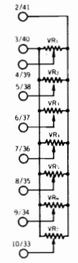
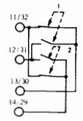
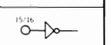
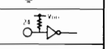
Maximum Ratings

Item	Symbol	Rating	Unit
Supply voltage	V_{DD}	13	V
Input voltage	V_{IN}	$-0.3\sim V_{DD}+0.3$	V
Power dissipation	P_D	800	mW

Terminal Connection

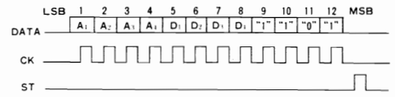


Terminal Function Table

Pin No.	Symbol	Function	Note
2 41	(L) VR_{IN} (R) VR_{IN}	Common input terminal of each volume.	
3 40	(L) VR_{OUT} (R) VR_{OUT}	Common output terminal of each volume.	
4 39	(L) VR_1 (R) VR_1	Common terminal of volume 1.	
5 38	(L) VR_2 (R) VR_2	Common terminal of volume 2.	
6 37	(L) VR_3 (R) VR_3	Common terminal of volume 3.	
7 36	(L) VR_4 (R) VR_4	Common terminal of volume 4.	
8 35	(L) VR_5 (R) VR_5	Common terminal of volume 5.	
9 34	(L) VR_6 (R) VR_6	Common terminal of volume 6.	
10 33	(L) VR_7 (R) VR_7	Common terminal of volume 7.	
11 32	(L) IN_1 (R) IN_1	Input terminal of analog switch matrix.	
12 31	(L) IN_2 (R) IN_2	Input terminal of analog switch matrix.	
13 30	(L) OUT_1 (R) OUT_1	Output terminal of analog switch matrix.	
14 29	(L) OUT_2 (R) OUT_2	Output terminal of analog switch matrix.	
15	F	Control input terminal of analog switch matrix ①.	
16	R	Control input terminal of analog switch matrix ②.	
28	F_{OUT}	Indicator-output terminal applied for control-input F of analog switch matrix ①.	
27	R_{OUT}	Indicator-output terminal applied for control-input R of analog switch matrix ②.	
24	$\overline{CL}$	Input terminal for clearing the initial state of analog switch matrix.	
20	ST	This is strobo input terminal for shifting to the taken-in control data. It is low-threshold value inverter input with CK, and DATA input.	
22	CK	Clock input terminal for read the control data.	
23	DATA	Control data input terminal.	
42 21 1	V_{DD} GND V_{SS}	Power supply terminal.	

Data Format

Data are of 12 bits, having the following construction.

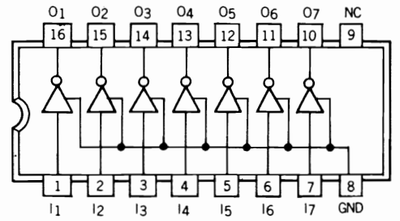


■ TD62504P 051-0443-00 NPN Transistor array

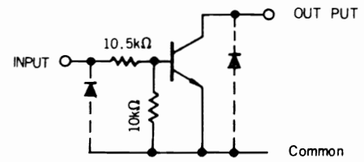
Maximum Ratings

Item	Symbol	Rating	Unit
Output voltage	V_{CER}	−0.5~50	V
Collector current	I_C	200	mA
Collector -emitter voltage	V_{CEO}	35	V
Collector-base voltage	V_{CBO}	50	V
Input voltage	V_{IN}	30	V
GND terminal current	I_{GND}	500	mA
Power dissipation	P_D	1.0 (2.5°C)	W

Block Diagram

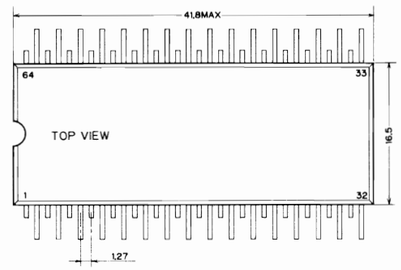


Equivalent circuit



■μPD7519HG-045 051-0754-02 Graphic Equalizer with Spectrum Analyzer Controller

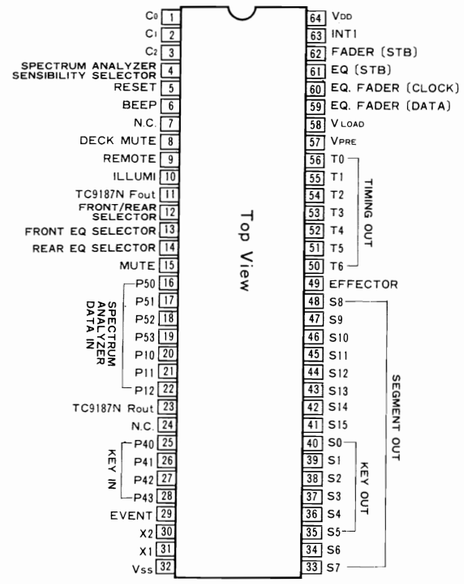
Outward Form



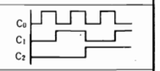
Absolute Maximum Ratings

Item	Symbol	Condition	Rating	Unit
Supply voltage	V_{DD}		−0.3~+7.0	V
Input voltage	V_I		$-0.3-V_{DD}+0.3$	V
Output voltage	V_O	Except display output terminal	$-0.3-V_{DD}+0.3$	V
	V_{OD}	Display output terminal	$V_{DD}-40-V_{DD}+0.3$	V
Power dissipation	P_T		600	mW

Terminal Connection



Terminal Function Table

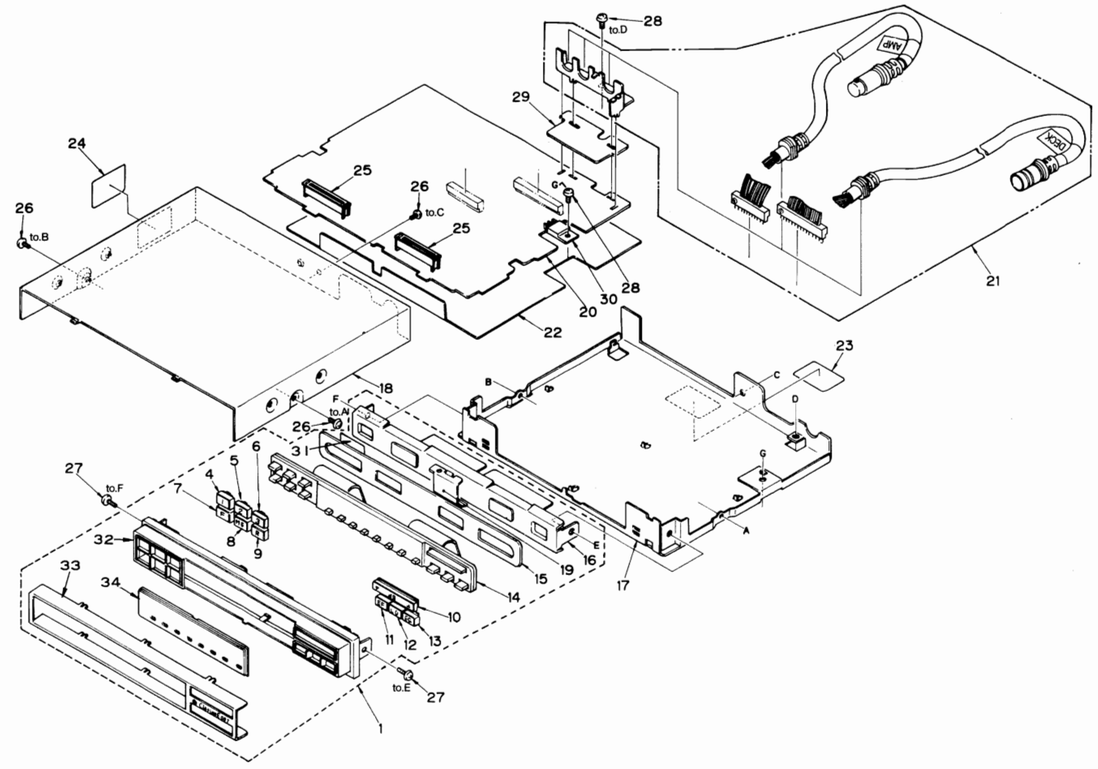
Pin No.	Terminal Name	I/O	Function
1	C_0	O	Signal output terminal to TC4051 (Multiplexer IC). 
2	C_1		
3	C_2		
4	SPECTRUM ANALYZER SENSIBILITY SELECTOR	O	With the output of "L", the sensitivity of spectrum analyzer is set to LO-state.
5	RESET	I	To reset the microcomputer when pulse is input.
6	BEEP	O	Buzzer signal output terminal.
7	N.C.	–	Not in use.
8	DECK MUTE	I	When deck is at its mute-state, this terminal is set to LO.
9	REMOTE	I	Auto power input. / Illumi power input. — Micro-computer does not operate unless the both terminals are at "L" state.
10	ILLUMI		
11	TC9187 Fout	I	Signal input terminal from TC9187N (Electronic volume IC).
12	FRONT/REAR SELECTOR	O	Output "L"→Analog switch IC8, 9 Pin No. 12, 13 are "H", Pin No. 5, 6 are "L". Output "H"→Analog switch IC8, 9 Pin No. 12, 13 are "L", Pin No. 5, 6 are "H".
13	FRONT EQ SELECTOR		In combination of "L" and "H" of both terminals, the equalizer makes the shifting of FRONT and REAR.
14	REAR EQ SELECTOR		
15	MUTE	O	MUTE signal output terminal. "L"→MUTE state.
16 ~ 19	P50 ~ P53	I	Spectrum analyzer data input.
20 ~ 22	P10 ~ P12		
23	TC9187N Rout	I	Signal input terminal from TC9187N (Electronic volume IC).
24	N.C.	–	Not in use.
25 ~ 28	P40 ~ P43	I	Key data input terminal. (See Key Matrix Table)
29	EVENT	–	GND
30	X2	O	Terminal for connecting a crystal resonator.
31	X1	I	
32	V_{SS}	–	GND
33 ~ 34	S7 ~ S6	O	Segment signal output terminal.
35 ~ 40	S5 ~ S0		Key data output (See Key Matrix Table) and segment signal output terminal.
41 ~ 48	S15 ~ S8		Segment signal output terminal.
49	EFFECTOR	O	When "L" is output, EFFECTOR ON.
50 ~ 56	T6 ~ T0	O	Timing signal output terminal.
57	V_{LOAD}	–	GND
58	V_{PRE}		
59	EQ, FADER (DATA)	O	DATA signal output of Equalizer and Fader.
60	EQ, FADER (CLOCK)		CLOCK signal output of Equalizer and Fader.
61	EQ (STB)		STROBO signal output of Equalizer.
62	FADER (STB)		STROBO signal output of Fader.
63	INT1	I	Connect with 56Pin (T0).
64	V_{DD}	–	Power supply terminal. (5 – 6V)

Key Matrix Table

IN \ OUT	S0 40Pin	S1 39Pin	S2 38Pin	S3 37Pin	S4 36Pin	S5 35Pin
P40 25Pin	60Hz	1kHz	△	EQ	CH1	FRONT
P41 26Pin	125Hz	3kHz	▽	LO	CH2	REAR
P42 27Pin	250Hz	10kHz	–	EF	CH3	–
P43 28Pin	500Hz	FADER	–	–	ME	–

■EXPLODED VIEW • PARTS LIST:

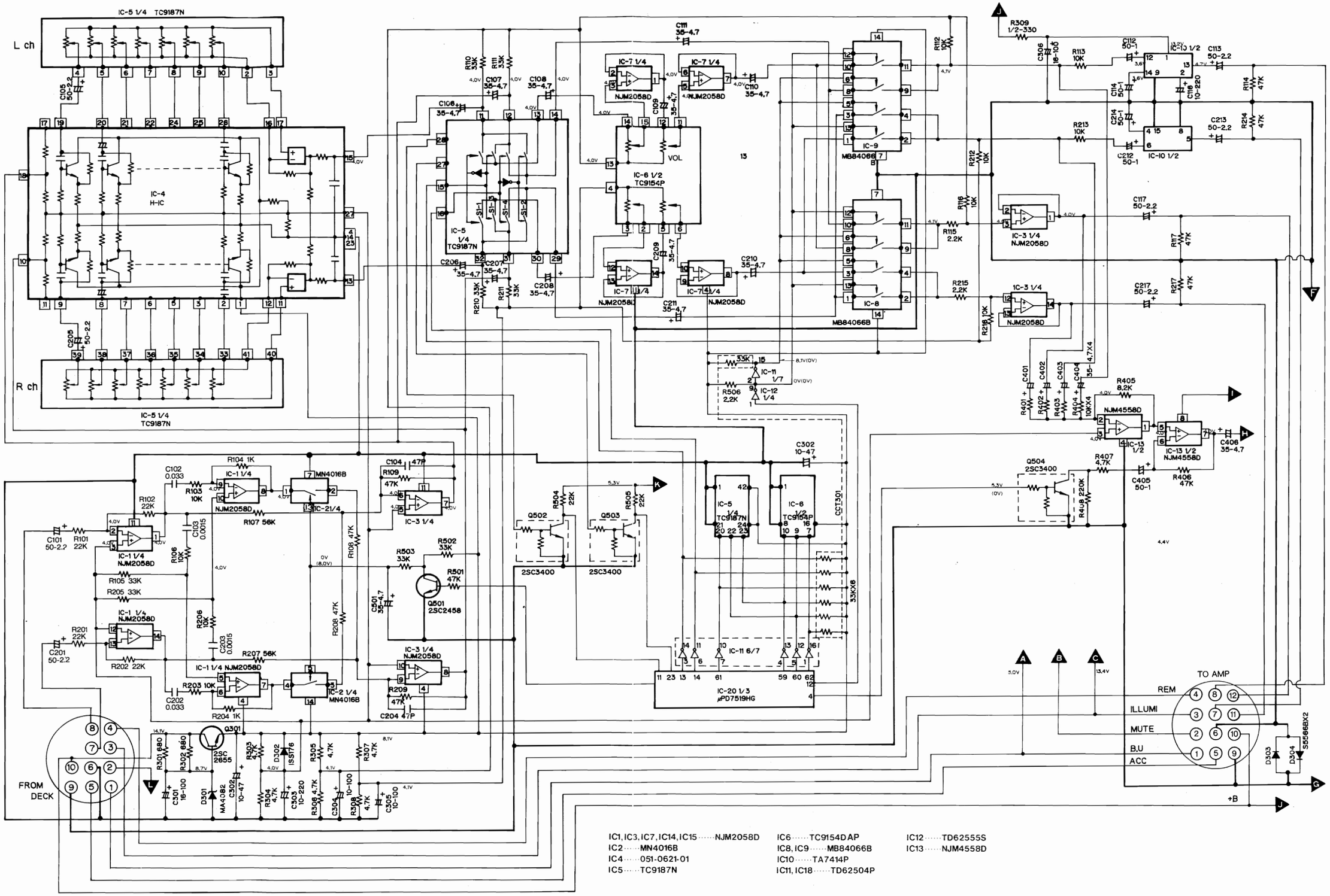
◎Main section



REF.NO.	PART NO. (ORDER NO.)	DESCRIPTION	Q'TY
1	940-0623A	Escutcheon ass'y	1
4	382-0877-00	Button (1)	1
5	382-0877-01	Button (2)	1
6	382-0877-02	Button (3)	1
7	382-0877-06	Button (F)	1
8	382-0877-07	Button (ME)	1
9	382-0877-08	Button (R)	1
10	382-0879-03	Button (dB)	1
11	382-0878-09	Button (EF)	1
12	382-0878-10	Button (LO)	1
13	382-0878-11	Button (EQ)	1
14	379-0098-01	Indicator	1
15	347-1983-00	Insulator	1
16	309-0550-00	Front plate	1
17	311-1229-00	Lower cover	1
18	310-1266-01	Upper cover	1

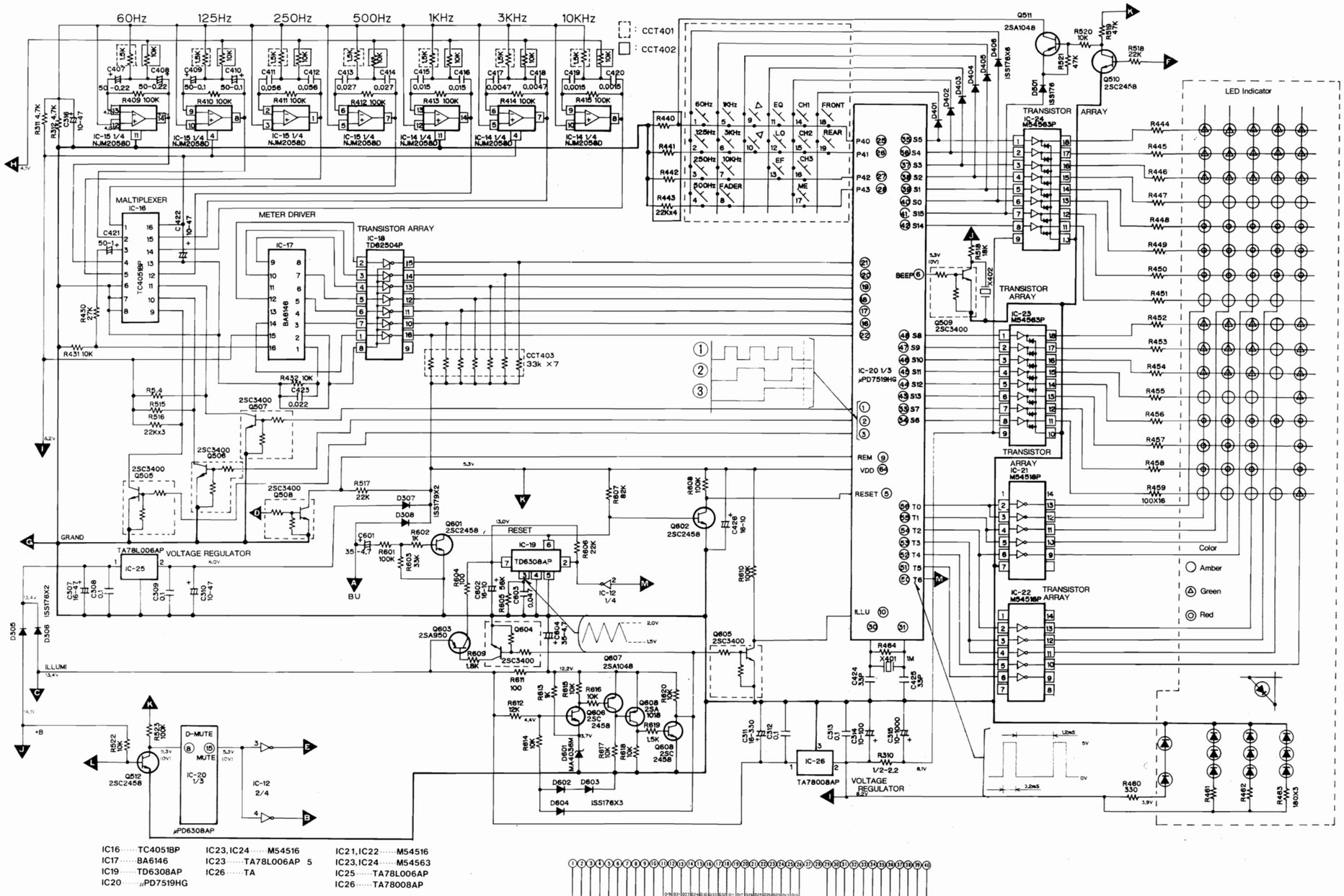
REF.NO.	PART NO. (ORDER NO.)	DESCRIPTION	Q'TY
19	330-8405-00	Bracket	1
20	099-7696-01	P.W.B	1
21	852-9253-00	Extension lead	1
22	347-1984-00	Insulator	1
23	286-5851-00	Set plate	1
24	285-1257-00	Guide label	1
25	074-0750-20	Socket	2
26	731-3006-89	Tap tight (M3x6)	3
27	731-3008-80	Tap tight (M3x8)	2
28	731-3006-80	Tap tight (M3x6)	2
29	347-2069-00	Insulator	1
30	051-0624-00	IC (TA78008AP)	1
31	340-1379-00	Spacer	1
32	370-3831-01	Escutcheon	1
33	370-3833-10	Escutcheon	1
34	373-0439-02	Dial cover	1

■CIRCUIT DIAGRAM:



IC1, IC3, IC7, IC14, IC15 ..... NJM2058D
IC2 ..... MN4016B
IC4 051-0621-01
IC5 ..... TC9187N
IC6 ..... TC9154DAP
IC8, IC9 ..... MB84066B
IC10 ..... TA7414P
IC11, IC18 ..... TD62504P
IC12 ..... TD62555S
IC13 ..... NJM4558D

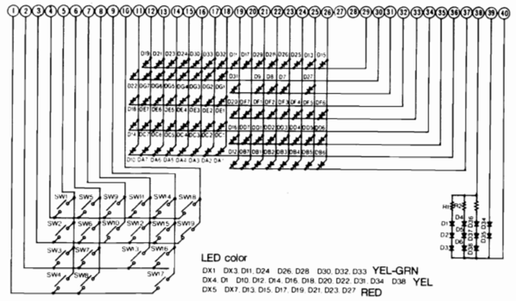
■CIRCUIT DIAGRAM:



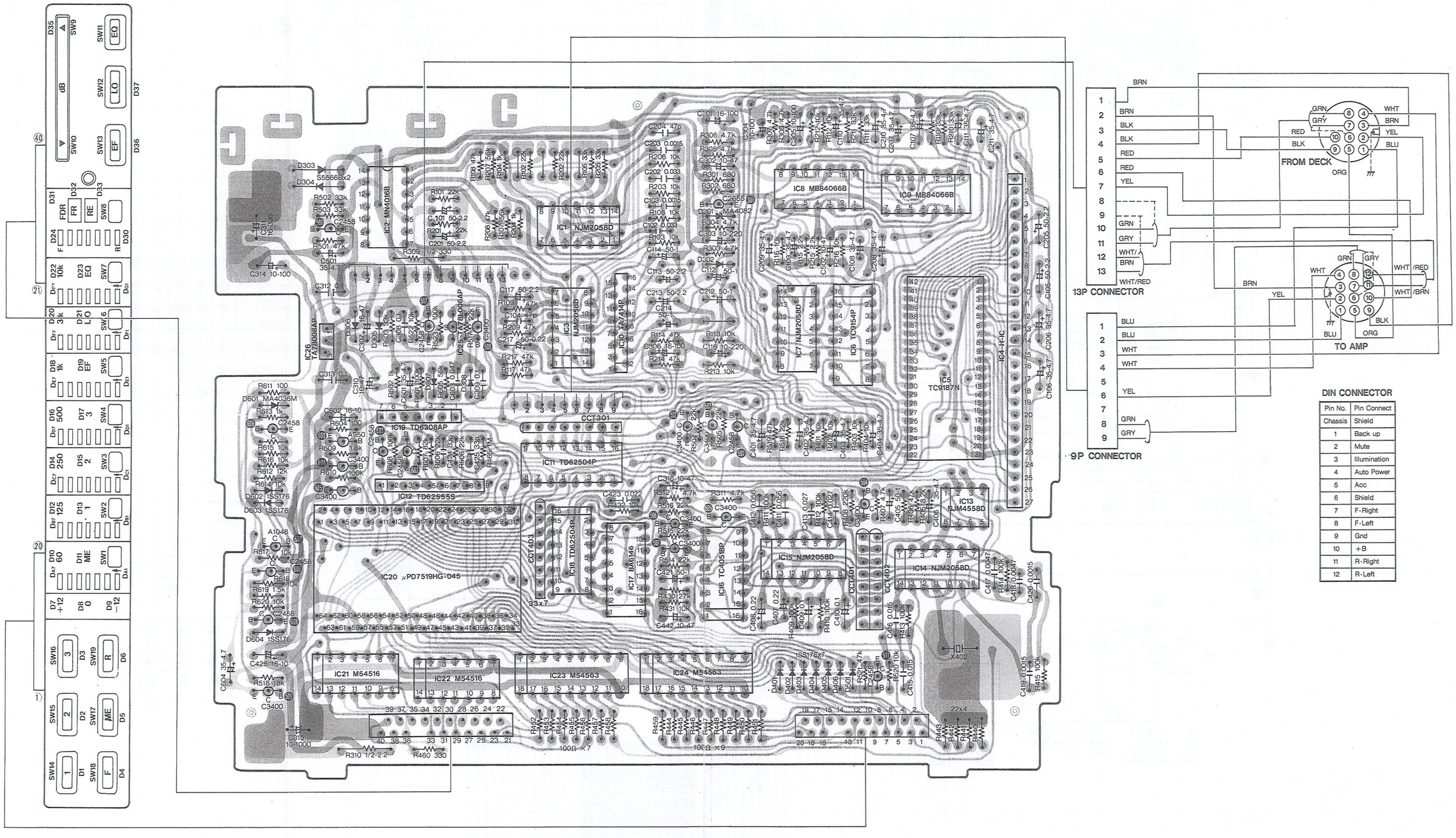
IC16 ..... TC4051BP
IC17 ..... BA6146
IC19 ..... TD6308AP
IC20 ..... μPD7519HG

IC23, IC24 ..... M54516
IC23 ..... TA78L006AP 5
IC26 ..... TA

IC21, IC22 ..... M54516
IC23, IC24 ..... M54563
IC25 ..... TA78L006AP
IC26 ..... TA78008AP


LED color
DX1 DX3 DX11 DX24 DX26 D28 D30 D32 D33 YEL-GRN
DX4 DX DX10 DX12 DX14 DX16 DX18 DX20 DX22 DX31 DX34 DX38 YEL
DX5 DX7 DX13 DX15 DX17 DX19 DX21 DX23 DX27 RED

■PRINTED WIRING BOARD:



■PARTS LIST:

◎Electrical section

REF.NO.	PART NO. (ORDER NO.)	DESCRIPTION	Q'TY
D_{601}	001-0377-17	Diode (MA4036M)	1
$D_{401\sim406,501\ 602\sim604}^{302,305\sim308}$	001-0352-00	Diode (1SS176)	15
$D_{303,304}$	001-0360-00	Diode (S5566B)	2
D_{301}	001-0423-23	Diode (MA4082)	1
IC_{2}	051-0158-70	IC (MN4016B)	1
$IC_{21,22}$	051-0265-50	IC (M54516P)	2
$IC_{8,9}$	051-0267-80	IC (MB84066BM-G)	2
$IC_{1,3,7,14,15}$	051-0287-51	IC (NJM2058D)	5
IC_{25}	051-0296-01	IC (TA78L006AP)	1
IC_{19}	051-0403-01	IC (TD6308AP)	1
IC_{13}	051-0422-51	IC (NJM4558D)	1
$IC_{11,18}$	051-0443-00	IC (TD62504P)	2
IC_{12}	051-0568-05	IC (TD62555S)	1
$IC_{23,24}$	051-0569-00	IC (M54563P)	2
IC_{4}	051-0621-01	IC (H-IC)	1
IC_{26}	051-0624-00	IC (TA78008AP)	1
IC_{16}	051-0625-00	IC (TC4051BP)	1
IC_{6}	051-0628-00	IC (TC9154P)	1
IC_{10}	051-0744-00	IC (TA7414P)	1
IC_{20}	051-0754-02	IC (μPD7519HG-045)	1
IC_{17}	051-0795-00	IC (BA6146)	1
IC_{5}	051-0808-00	IC (TC9187N)	1
X_{402}	060-0071-00	Buzzer	1
X_{401}	060-0109-00	Ceramic resonator	1
$CCT_{301,403}$	050-0088-61	Component circuit	2
CCT_{402}	050-0088-63	Component circuit	1
CCT_{401}	050-0088-65	Component circuit	1
Q_{603}	100-0950-00	Transistor (2SA950)	1
$Q_{511,607,608}$	100-1048-00	Transistor (2SA1048)	3
$Q_{602,606,608}^{501,510,512,601}$	102-2458-00	Transistor (2SC2458-Y,GR,BL)	7

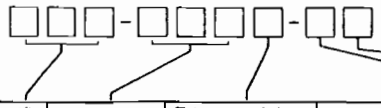
REF.NO.	PART NO. (ORDER NO.)	DESCRIPTION	Q'TY
Q_{301}	102-2655-00	Transistor (2SC2655)	1
$Q_{506,507,508,509\ 604,605}^{502,503,504,505}$	102-3400-00	Transistor (2SC3400)	10
R_{310}	111-2291-81	Film resistor (½Ws2.2Ω)	1
R_{309}	111-3311-81	Film resistor (½Ws330Ω)	1
$C_{308,309,312,313}$	173-1042-10	Polyester capacitor (0.1μF) S	4
$C_{103,203,419,420}$	173-1522-10	Polyester capacitor (0.0015μF) S	4
$C_{415,416}$	173-1532-10	Polyester capacitor (0.015μF) S	2
C_{423}	173-2232-10	Polyester capacitor (0.022μF) S	1
$C_{413,414}$	173-2732-10	Polyester capacitor (0.027μF) S	2
$C_{102,202}$	173-3332-10	Polyester capacitor (0.033μF) S	2
$C_{417,418}$	173-4722-10	Polyester capacitor (0.0047μF) S	2
C_{603}	173-4732-10	Polyester capacitor (0.047μF) S	1
$C_{411,412}$	173-5632-10	Polyester capacitor (0.056μF) S	2
$C_{424,425,701}$	174-3309-13	Ceramic capacitor (33pF) TC	3
$C_{104,204}$	174-4700-13	Ceramic capacitor (47pF) TC	2
$C_{304,305,314}$	179-1073-22	Electrolytic capacitor (10V100μF) S	3
C_{315}	179-1083-22	Electrolytic capacitor (10V1000μF) S	1
$C_{116,303}$	179-2273-22	Electrolytic capacitor (10V220μF) S	2
C_{311}	179-3373-32	Electrolytic capacitor (16V330μF) S	1
$C_{302,310,316,422}$	179-4763-22	Electrolytic capacitor (10V47μF) S	4
$C_{409,410}$	182-1043-62	Electrolytic capacitor (50V0.1μF) SS	2
$C_{405,421}^{112,114,212,214}$	182-1053-62	Electrolytic capacitor (50V1μF) SS	6
$C_{426,602}$	182-1063-32	Electrolytic capacitor (16V10μF) SS	2
$C_{301,306}$	182-1073-32	Electrolytic capacitor (16V100μF) SS	2
$C_{407,408}$	182-2243-62	Electrolytic capacitor (50V0.22μF) SS	2
$C_{201,205,213,217}^{101,105,113,117}$	182-2253-62	Electrolytic capacitor (50V2.2μF) SS	8
$C_{208,209,210,211\ 401\sim404,406\ 501,601,604}^{106,107,108,109\ 110,111,206,207}$	182-4753-52	Electrolytic capacitor (35V4.7μF) SS	20
C_{502}	182-4763-22	Electrolytic capacitor (10V47μF) SS	1
C_{307}	182-4763-32	Electrolytic capacitor (16V47μF) SS	1

Note : OM (Oxidized Metal)
S (Small)
HD (Higher Dielectric)
SC (Semi-Conductor)
SS (Super Small)
TC (Temperature-Compensating)
LL (Low Leak)
USS (Ultra Super Small)

● How to read resistor

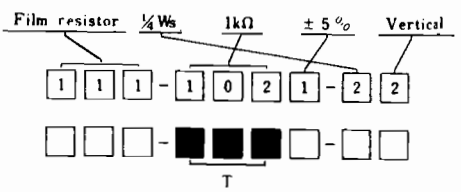
Resistors are deleted from the table of electric components, (except metal film resistors and special resistors). They can be converted to product Nos. as follows.

Film resistor (Carbon film resistor)



Classification	Resistance *		Tolerance of the value of resistance		Rated power			Shape	
1 1 1		0		0			0		
	Example	1	± 5 %	1	1/8 W	Approx. 3.7mm	1	Horizontal	
	33Ω = 330	2		2	1/4 Ws	Approx. 6.5mm	2	Vertical	
	33kΩ = 333	3		3			3		
		4		4	1/2 W	Approx. 9mm	4		
				7	1/8 W	Approx. 3.5mm			
				8	1/2 Ws	Approx. 6.6mm			
				9	1/4 Wss	Approx. 3.2mm			

(Example)



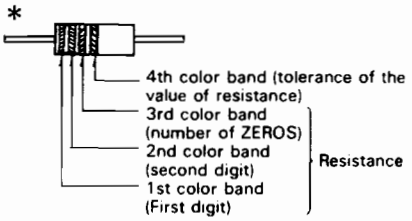
Note 1. The first two of three digits representing resistance are effective digits and the last one represents number of "0" following this.
Unit is given in ohm (Ω).

Example of conversion of resistance T ■■■□

Note) R : Resistance, T : Converted value

R	T	R	T	R	T	R	T	R	T	R	T	R	T	R	T	R	T	R	T
Ω 0.1	108	Ω 1.0	109	Ω 10	100	Ω 100	101	kΩ 1.0	102	kΩ 10	103	kΩ 100	104	MΩ 1.0	105	MΩ 10	106	MΩ 100	107
0.15	158	1.5	159	15	150	150	151	1.5	152	15	153	150	154	1.5	155	15	156	150	157

COLOR	BLK	BRN	RED	ORG	YEL	GRN	BLU	PUR	GRY	WHT	GOLD	SILVER	NO COLOR
1st color band	0	1	2	3	4	5	6	7	8	9			
2nd color band	0	1	2	3	4	5	6	7	8	9			
3rd color band	10^0	10^1	10^2	10^3	10^4	10^5	10^6				10^{-1}	10^{-2}	
4th color band											± 5 % (J)	± 10% (K)	± 20% (M)


*
4th color band (tolerance of the value of resistance)
3rd color band (number of ZEROS)
2nd color band (second digit)
1st color band (First digit)
Resistance